IMPLEMENTATION OF LESSON STUDY WITH PROBLEM-SOLVING-BASED DISCOVERY LEARNING MODEL TO IMPROVE MATHEMATICAL LITERACY SKILLS IN SPLDV CLASS X MATERIAL

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ABSTRACT

This research aims to determine the implementation of lesson study with a discovery learning model based on problem solving in the System of Two Variable Linear Equations (SPLDV) material, increasing students' activeness and mathematical literacy skills and looking at student motivation. This research was carried out three times with the stages plan (planning), do (implementation), and see (reflection) at SMK PGRI 1 Taman, Pemalang Regency with the research subjects being class X TSM 3 students, totaling 36 students. This research uses a qualitative-quantitative approach where researchers collect qualitative data and quantitative data. Qualitative data was obtained in the form of documentation such as pictures during the learning process by implementing lesson study with a discovery learning model based on problem solving. The quantitative data obtained in this research were in the form of active observation sheets used by observers to observe students' activities during the learning process, test sheets for testing mathematical literacy abilities and student learning motivation questionnaires. The research results show that the learning process can run well, students can understand mathematics material. The test results of students' mathematical literacy skills and activeness can increase with each meeting and the average student motivation is in the sufficient category. Based on the research results, this research only discusses how to implement lesson study with a discovery learning model based on problem solving in the mathematics learning process. So that similar research regarding the implementation of lesson study with a discovery learning model based on problem solving can examine other learning processes.

Keywords: Lesson Study, Discovery Learning, Mathematical Literacy.

INTRODUCTION

Mathematics is a field of science that is studied at the education level from kindergarten to the university level. Mathematics taught in schools has

a role in developing children in the ability to calculate, measure, decrease, and use mathematical formulas applied in daily life (Aritonang & Safitri, 2021). In addition, according to Koeswati (2019) mathematics is a subject that pressures students to think logically, systematically, critically, creatively, and work together so that they can improve their problem-solving skills. That means literacy skills are needed in learning and understanding mathematics (Hapsari, 2019).

Mathematical literacy can be interpreted as a person's ability to be able to plan, apply and interpret mathematics into various contexts, which involves reasoning and the use of mathematical concepts, producers, facts, and tools to describe, explain, and relate them to daily life (Hapsari, 2019; Mawarsari et al., 2023). Mathematical literacy can help a person to understand the role or function of mathematics in daily life. In addition, mathematical literacy also underlines students' ability to analyze, reason and convey ideas effectively in solving mathematical problems they find (OECD, 2018). One way to face challenges in the 21st century and in the modern era is to have mathematical literacy skills (Janah et al., 2019).

Table 1:
Indonesian Mathematics Literacy Results in PISA 2015-2022

No	Year	Rank	Many Countries	Score	International Average Score
1	2015	69	76	386	490
2	2018	73	78	379	489
3	2022	70	81	366	472

(Source: OECD, 2022)

The mathematical literacy ability of Indonesian students is still very low (Masfufah & Afriansyah, 2021). Mathematical literacy in Indonesia is relatively low, this is evidenced by the achievement of Indonesian mathematical literacy in PISA. PISA (Program for International Student Assessment) or the International Assessment Program for students is an international survey conducted by the Organisation for Economic Co-operation and Development (OECD) to evaluate the ability of students at the age of 15 years in the fields of reading, mathematics and science (Indrawati, 2020).

After conducting an interview with one of the mathematics teachers at SMK PGRI 1 Taman, it was found that the learning process was felt to be less innovative. Students still have difficulty in understanding and learning mathematics subjects. Several factors that cause students to have difficulties in these problems include; 1) Teachers only use conventional learning methods during the learning process that make students feel bored while learning, 2) Limited students' mathematical literacy skills so that students still have difficulty in solving problems, 3) The sources of learning information used are still few, 4) Students are not trained in problems related to daily life. The limited mathematical literacy ability of students is

characterized by students having difficulty understanding basic mathematical concepts. During the process of solving mathematical problems, students are less skilled in presenting contextual problems, especially in the material of the two-variable linear equation system (SPLDV). Sari (2017) stated that story problems in linear equations usually require students to turn the problem into a mathematical model that looks like feeding something with variables. In this material, students learn to solve everyday problems, in solving mathematical problems students must apply mathematical concepts (Kurniawan et al., 2022).

The Two-Variable Linear Equation System (SPLDV) material is one of the mandatory materials that must be mastered by students in learning mathematics, this is related to the material that will be studied next (Agustini & Pujiastuti, 2020). The reason for choosing a two-variable linear equation system is that the material can develop problem-solving skills by finding the values of variables in linear equations. This material is related to the content of PISA change and relationship and is a contextual problem related to problems in life that are in accordance with mathematical literacy indicators. This is as explained by the OECD (2018) that mathematical literacy departs from contextual problems that originate from real life by applying knowledge and skills, identifying problems, and applying mathematical procedures to obtain mathematical results.

The use of inappropriate learning methods by teachers also causes students' motivation and activeness in learning mathematics to decrease (Hapsari, 2019). The use of conventional learning methods or lectures that make one-way communication with students that teachers still apply in mathematics learning is less effective, because it makes a lack of interaction so that it causes a sense of saturation in students (Hajrah et al., 2021). This is because during the learning process, student activities are only limited to seeing, hearing and recording lessons delivered by the teacher. Boredom and boredom cause a lack of motivation and activeness of students in participating in mathematics learning (Tosi et al., 2021). In this case, there needs to be an innovation in learning, in addition to aiming to improve mathematical literacy, it is also expected to increase the motivation and activeness of students in participating in mathematics learning. The learning method used must be able to facilitate the needs of students such as the media and information sources used in learning, so that later students can get what they need during the learning process. According to Wahyuni (2020), an educator should be able to apply effective and innovative learning methods that will later be applied in the classroom. Therefore, a step is needed to improve the quality and capacity of teachers in the learning process, one of which is the implementation of lesson study. Lesson Study is a program to improve teachers' pedagogic and professional competencies that is developed in a structured manner in the education system in Japan with the main goal of creating a better and more effective learning process (Yustitia et al., 2018). According to Abidzar (2020), lesson

study is implemented with collaboration between teachers with the stages of planning (plan), implementation (do), and reflection (see). The plan stage has the purpose of compiling the needs of students needed during learning, the do stage is an activity to implement the activities that have been prepared at the plan stage. The application stage is carried out by a model teacher and an observer who observes student learning activities. The reflection stage (see) is an activity to evaluate the learning outcomes of students that are taking place. According to the results of the evaluation between the model teacher and the observer, the next learning plan can be rearranged, so that the learning carried out becomes effective. The application of the right learning model can encourage students to support lesson study activities more optimally (Abizar, 2020), one of the learning models that can be applied is the Discovery Learning model.

Discovery learning is a learning model that requires students to find concepts or principles in the learning process on their own, so students are required to be active (Yerizon & Sarti, 2021). The discovery learning model is defined as a learning process that occurs when students are not presented with information directly but students are required to organize their understanding of the information independently (Purwati & Samiu, 2022). The Ministry of Education and Culture (2013) stated that in the application of the Discovery learning model, there are 6 stages that must be carried out during the learning process in the classroom, namely, (1) Stimulation (Stimulus), (2) Problem Statement, (3) Data Collection, (4) Data Processing, (5) Verification, and (6) Drawing conclusions.

Based on the description above, a study was conducted with the title Implementation of Lesson Study with a Problem Solving-Based Discovery Learning Model to Improve Mathematical Literacy Skills in Class X SPLDV Material.

METHOD

This study uses the Qualitative-Quantitative method (Mix Methode) to describe the implementation of Lesson Study with a Problem Solving-Based Discovery Learning model, increasing students' activeness and mathematical literacy skills, and looking at student motivation. The subjects in this study are students of SMK PGRI 1 Taman with a total of 36 students. Data collection techniques use documentation, observation, tests and questionnaires. The instruments used were mathematical literacy tests, activity observation sheets and student motivation questionnaires. The data analysis technique in this study uses the Miles & Huberman data analysis technique. The analysis of test question data uses validity, reliability, differentiation and level of difficulty. Motivation questionnaire analysis uses validity and reliability. The data analysis technique in the study uses the analysis technique of the mathematical literacy ability test of grade X students on the SPLDV material. The researcher scored each student's answer based on three mathematical literacy skills processes that

aimed to determine students' mathematical literacy skills. Then, to determine the value category of students' mathematical literacy skills, it can be done by identifying the percentage of the score based on the following formula.

$$Skor = \frac{Skor\ Siswa}{Skor\ Maksimal}\ x\ 100\%$$

After the calculation of the score percentage, it will then be qualified into three categories, namely, high, medium, and low with criteria from the Gronlund & Linn table as quoted from Widianti & Hidayati, (2021).

Table 2:
Criteria for Assessment of Mathematical Literacy Ability

Score	Category
$X \geq (X + SD)$	Tall
$(X - SD) < X < (X + SD)$	Keep
$X \leq (X - SD)$	Low

Next, the calculation of the gain test and N-gain is carried out. This test was carried out to see the category of improving students' mathematical literacy before and after the use of the discovery learning method based on solving problems in SPLDV material. The formula used to see the gain is as follows.

$$gain = (nilai\ posttest) - (nilai\ pretest)$$

As for the N-Gain test, the following formula is used:

$$N - gain = \frac{Nilai_{posttest} - Nilai_{pretest}}{Nilai_{max} - Nilai_{pretest}}$$

The magnitude of the increase in students' mathematical literacy is categorized based on the N-Gain criterion (Ramadhani & Amudi, 2020)

Table 3:
Criteria for Improving Mathematical Literacy Skills

N-gain	Criterion
0.7 ≤ N-gain ≤ 1	Tall
0.3 ≤ N-gain < 0.7	Keep
N-gain < 0.3	Low

FINDINGS AND DISCUSSION
Findings
The implementation of the lesson study was carried out three

meetings using a problem-solving-based discovery learning learning model so that students could solve SPLDV problems related to daily life. Each meeting was held for two hours of lessons in class X TSM 3 SMK PGRI 1 Taman.

The plan stage, the initial phase of the first meeting is planning which starts with the condition of students who have mathematical literacy skills that are still relatively low so that the results of students' mathematical literacy skills test are also low. This makes researchers compile learning that will be carried out based on the initial conditions of students submitted by the mathematics teacher and the results of the pretest, especially on questions related to problems in daily life. The learning design made by the researcher is in the form of lesson design and learning tools. Based on the design, the lesson study activities carried out at the first meeting use the discovery learning learning model so that students can solve SPLDV problems.

In the do stage, the researcher starts learning starting from the opening greeting, providing motivation and stimulus to entering into daily problems. Students are divided into groups with a total of 3-4 students. The researcher provided SPLDV problems related to daily life to be identified first and then worked together with his group with the data collection stage. After the data is obtained, students process the data to find the results asked. Furthermore, students prove and draw conclusions from the results that have been obtained. Students are also given time to understand the material in their books or other sources on the internet for 10 minutes.

In the see stage, the evaluation is carried out after the learning takes place. At this stage, the team discussed all activities carried out in the do stage. Based on the learning process that has been carried out, discovery learning has not been able to raise questions to students but can attract attention when given a stimulus. When given a problem, students are not used to identifying and understanding what is being asked. Students can only collect data or information from the given problem and during the data processing process students still have difficulties, especially when converting problems into mathematical models. Students still have difficulty in solving the problems given and students do not want to ask their teachers or friends when they are in difficulty. At the first meeting, many had not reached the stage of proving and drawing conclusions from the results that had been obtained. At the end of the learning process, students do not dare to present the results of their work in front of the class.

Student learning activity is observed through student learning activity observation sheets containing indicators of student activity. The assessment on this observation sheet is by determining the percentage of activity of all students in each meeting.

Table 4:
Student Activity Category

Presented	Information
75% - 100%	Tall
51% - 74%	Keep
25%-50%	Low
0%-24%	Very Low

The results of the observation of student activity at each meeting are as follows:

Figure 1:
Student Activity Graph
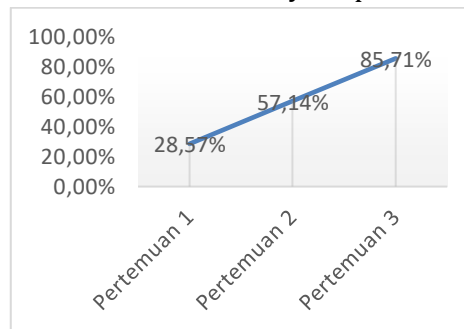
To obtain data on student learning motivation after discovery *learning* on SPLDV material, it can be obtained from the results of a questionnaire that has been given to 36 students. The questionnaire about student learning motivation consisted of 29 question items with 12 positive question items and 17 negative question items. Each question is accompanied by 5 alternative answers with a score of 5, 4, 3, 2 and 1 for positive questions, while for negative questions 1, 2, 3, 4 and 5, for questions that are not answered are given a score of 0, both for positive and negative questions.

To determine the quantitative value of student learning motivation with *discovery learning* in SPLDV material is to sum the questionnaire answer scores from the respondents according to the frequency of answers. To be clearer, it can be seen in the table below.

Table 5:
Categories Student Motivation

Frequency	Number of Students	Group
117 – 126	9	Very High
107 – 116	4	Tall
97 – 106	9	Enough
87 – 96	12	Low
77 - 86	2	Very Low

Based on the results of the research that has been carried out, researchers can find out the criteria for the value of students' mathematical

literacy skills through the learning carried out. The results of students' mathematical literacy skills were taken from each student which was carried out during the face-to-face learning process. The following are the results of the criteria for the level of students' mathematical literacy skills which can be seen in the following graphic image.

Figure 1:
Graph of Students' Mathematical Literacy Abilities Category
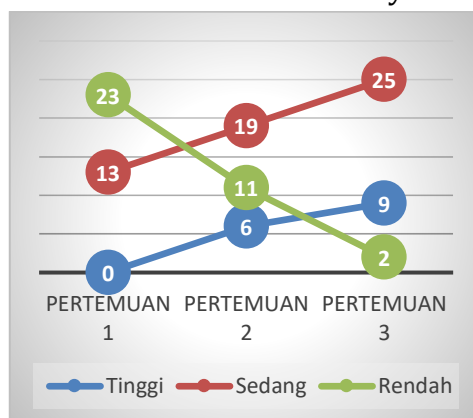
Furthermore, researchers can find out the extent of increasing the value of students' mathematical literacy skills through the learning carried out. The results of increasing students' mathematical literacy skills were taken from each student during the learning process. The following are the results of increasing the value of students' mathematical literacy skills which can be seen in the following graphic image.

Discussion

 a) **Implementation of** *Lesson Study*

The stage of problem-solving-based discovery learning begins by forming a group whose members are not determined by the model teacher but with a number of members of 3-4 students. Then it is followed by applying the syntax of discovery learning which begins with stimulation by providing information about learning objectives and asking questions to students to arouse curiosity. Model teachers distribute LKPD to each group to identify existing problems by collecting the data needed to complete LKPD. In the data processing step, the model teacher gives the entire group the opportunity to interpret and process the data that has been obtained. This is in line with Purnomo's opinion, (2020) that the completion of assignments in groups allows students to discuss well. Students are given the opportunity to explore available learning resources either through maple books or the internet. The last step is for students to prove and draw conclusions from the results that have been obtained. During the learning process, the model teacher (researcher) and observer go around the classroom observing all activities and observing student behavior, if the teacher finds that his student is constrained or experiencing difficulties, the

teacher must approach the student and ask about the problem then direct him to ask for help from one of his friends. This aims to observe the advantages or disadvantages that exist in each student when conducting discussion activities (Tosi et al., 2021)

The reflection stage at the first meeting during the discovery learning process has not been able to raise questions to students when given a stimulus. When given problems, students are not used to identifying and understanding what is asked about literacy questions. This is in line with the statement of Agustini & Pujiastuti, (2020) which states that the difficulty experienced by students is that they do not understand what is asked in the question. Students can only collect data or information from the given problem and during the data processing process students still have difficulties, especially when converting problems into mathematical models. Students still have difficulty in solving the literacy questions given, so they need to continue to be trained with literacy questions. This is in accordance with the statement (Hapsari, 2019) which says that efforts that can be made to improve students' mathematical literacy skills are to get students used to solving mathematical problems.

Reflection at the second meeting based on the discovery learning process that has been carried out has not been able to raise questions to students but has been able to attract students' attention when given stimulus. When given a problem, students can already identify and understand what is being asked. Students can also collect data or information from the given problems, but during the data processing process students still have difficulties when converting problems into mathematical models. This is in line with the results of the study (Agustini & Pujiastuti, 2020) which states that if the difficulties experienced by students are not understanding what is asked in the question, it is difficult to change literacy questions into mathematical symbols. When solving problems, students are willing to ask their teachers and friends when they are in difficulty. At the time of drawing conclusions, some students were still unable to draw conclusions from the results that had been obtained. Students are willing to present the results of their work in front of the class, but other students do not pay attention.

The reflection stage at the third meeting in the implementation of problem-solving-based discovery learning can be followed well by students. Students are good at understanding and solving math problems related to daily life. Understanding the material directly carried out by students can help students when understanding material related to mathematics which is not enough by just memorizing formulas but also having to know where the funds come from and how the formulas are obtained (Naufal, 2021). With lesson studies that are carried out collaboratively, it can benefit teachers and students. As stated by Purwati et al., (2022) that the benefits obtained are that they provide an opportunity for teachers to think more

carefully about the goals and materials that students will learn.

b) Student Learning Activity

Based on the learning that has been carried out from the first meeting to the third meeting, the students' learning activity has increased significantly. There are several factors that affect student learning activity during the learning process, including being able to cause learning activity by providing encouragement or attracting students' attention during learning, so that they can identify problems carefully and can understand when processing data to solve these problems. This is in accordance with the opinion (Rahayu et al., 2019) which explains that by provoking students to be actively involved in learning activities by discovering and organizing their own material concepts, students can understand the subject matter freely. This opinion is in line with the results of research (Prasetyo & Abduh, 2021) which shows that more and more students pay attention to the material delivered by the teacher because learning presented with the discovery learning model can increase students' enthusiasm for learning. This opinion is reinforced by (Susilowati, 2022) who said that discovery learning is an effective step in encouraging increased student activity during the learning process at school.

At the first meeting, student activity only reached the low criterion with a percentage of 28.57%. Some of the factors that cause low student activity are when most of the students' attention is still distracted outside the classroom, there is no feedback or questions to the teacher, lack of student discussion, students have not been able to explore or find sources of learning information other than the teacher, students have not been able to give opinions on learning, students do not dare to ask questions if the material being studied has not been understood, Students do not want to present the results of their work in front of the class and have not been able to draw conclusions from the learning that has been carried out. This is in line with the results of Busa's research, (2023) which explains that several factors that can affect students' learning activity are lack of confidence, fear of answering, and unwillingness to ask questions, as well as students showing inactivity at certain times in learning activities. These results are reinforced by a statement from Septiawati et al., (2022) which explains that internal factors that affect students' learning activity come from within students, namely, such as health, attention, response, and intelligence.

In the second meeting, student activity increased considerably compared to the first meeting by reaching a percentage of student activity of 57.14% with moderate criteria. Some of the factors that cause low student activity during learning are the absence of feedback or responses during the teacher's explanation, students have not been able to explore or find sources of learning information other than the teacher. Students have dared to present the results of their work in front of the class, but other students do not pay attention and students have not been able to give

conclusions from the learning materials that have been carried out. At the third meeting, student activity increased to 85.71% and was included in the criteria for high activity. With this, it can be said that it has met the indicators of success. This can be seen from several activities carried out by students. When learning students pay attention to the teacher's explanation and are able to give feedback or questions to the teacher, students are already active in discussions either in groups or with other groups, students can already explore or find sources of learning information other than the teacher, students can provide learning conclusions that have been carried out, and students can already give responses when their friends present the results of their work in front of the class.

c) Student Learning Motivation

The average learning motivation of students in class X TSM 3 SMK PGRI 1 Taman is in the "Adequate" category. This can be seen during the discovery learning process, many students are not diligent in the process of collecting and processing data when solving problems given in the learning process. High motivation can help students when solving math problems. This is in line with the results of research (Nasrah, 2020) which states that high motivation can help in finding and solving problems with a percentage of 80%. This is reinforced by the results of research (Hasibuan et al., 2021) if the application of the discovery learning model can increase students' learning motivation in mathematics subjects. As stated by Perdana, (2019) if motivation plays a very important role in the learning process, because the lack of motivation in students is very influential. Motivating students can be done by doing the best possible learning, instilling the importance of learning mathematics, facilitating students to learn while thinking, and connecting mathematics with students' interests (Hapsari, 2019). With good learning motivation, students will know the benefits of learning and can increase the enthusiasm for learning in students.

d) Students' Mathematical Literacy Skills

Students' mathematical literacy skills can be said to be quite good because students are able to solve problems by identifying problems, formulating and applying mathematical equations and being able to solve problems and interpret or conclude the results obtained appropriately. If students can apply mathematics to the problem, they can identify the problem in the problem. But on the other hand, if students have difficulty applying mathematics to the problem, students also have difficulty in identifying the problem in the problem. This is in accordance with the statement of Prabawati et al., (2021) which said that students will have difficulty identifying the elements contained in the problem if they have difficulty applying the problem into mathematical equations.

The questions given to students are two-variable linear equation system problems related to daily life. Students are asked to identify in advance the existing problems. Next, students collect what is known about

all the information/data in the question. The next stage is data processing by converting the information/data obtained into mathematical equations. At this stage, many students are still struggling or confused when applying mathematics to problems such as changing what is known with a variable x or y. As explained by Farida et al., (2021) after identifying the problem, students must be able to convert the problem into a suitable mathematical model into the form of variables. This is reinforced by the statement of Hapsari, (2019) that in solving mathematical literacy problems, students' difficulties are mostly changing from story problems (context) to math problems. After converting into mathematical form, students work on problems according to the steps to solve them until they draw conclusions.

The factor that causes students' low mathematical literacy ability is the lack of training of students with literacy problems, so that students are not used to working on literacy problems. This is as explained by (Janah et al., 2019) mathematical literacy is indispensable in daily life because it is one of the keys to facing a society that is constantly changing. In addition, students are still lacking in identifying existing problems and have not been able to apply mathematics to their daily lives. This is in line with the results of research (Agustini & Pujiastuti, 2020) which states that if the difficulties experienced by students are not understanding what is asked in the problem, it is difficult to change literacy questions into mathematical symbols, so students must often be trained by being given problems related to daily life. Therefore, students' mathematical literacy skills need to be trained using PISA type questions (Mansur, 2018). This is reinforced by the results of research (Hapsari, 2019) which says that efforts that can be made to improve students' mathematical literacy skills are to familiarize students with solving mathematical problems related to the context of daily life.

CONCLUSION

Based on the above discussion, it can be concluded that: (1) the implementation of lesson study with a problem-solving-based discovery learning model can improve students' mathematical literacy skills, and student activity, (2) the average motivation of students in class X TSM 3 is in the sufficient category, (3) students' mathematical literacy ability by applying a problem-solving-based discovery learning learning model can reach high criteria. In this case, the researcher suggests that teachers can apply or provide a variety of *lesson study* models with *discovery learning* models with various practice questions in the form of literacy related to daily life to further improve students' mathematical literacy skills.

REFERENCES
Agustini, D., & Pujiastuti, H. (2020). Analisis Kesulitan Siswa Berdasarkan Kemampuan Pemahaman Matematis dalam Menyelesaikan Soal Cerita

Pada Materi SPLDV. *Media Pendidikan Matematika*, *8*(1), 18. https://doi.org/10.33394/mpm.v8i1.2568

Aritonang, I., & Safitri, I. (2021). Pengaruh Blended Learning Terhadap Peningkatan Literasi Matematika Siswa. *Jurnal Cendekia : Jurnal Pendidikan Matematika*, *5*(1), 735–743. https://doi.org/10.31004/cendekia.v5i1.555

Farida, R. N., Qohar, A., & Rahardjo, S. (2021). Analisis Kemampuan Literasi Matematis Siswa SMA Kelas X Dalam Menyelesaikan Soal Tipe Pisa Konten Change and Relationship. *Jurnal Cendekia : Jurnal Pendidikan Matematika*, *5*(3), 2802–2815. https://doi.org/10.31004/cendekia.v5i3.972

Hajrah, H., Nasir, M., & Olahairullah, O. (2021). Implementasi Model Pembelajaran Discovery Learning Untuk Meningkatkan Literasi Sains Siswa Kelas XI di SMA Negeri 1 Soromadi. *JISIP (Jurnal Ilmu Sosial Dan Pendidikan)*, *5*(4), 1113–1118. https://doi.org/10.58258/jisip.v5i4.2439

Hapsari, T. (2019). Literasi Matematis Siswa. *Euclid*, *6*(1), 84. https://doi.org/10.33603/e.v6i1.1885

Hasibuan, E. K., Rambe, N. A., & Saleh, S. (2021). Penerapan Model Pembelajaran Discovery Learning Untuk Meningkatkan Motivasi Belajar Dan Hasil Belajar Matematika Siswa Kelas Viii Mts. *AXIOM : Jurnal Pendidikan Dan Matematika*, *10*(1), 61. https://doi.org/10.30821/axiom.v10i1.8532

Indrawati, F. (2020). Peningkatan kemampuan literasi matematika di era revolusi industri 4.0 [Improving mathematical literacy skills in the era of the industrial revolution 4.0]. *Proceeding of Seminar Nasional Sains*, *1*(1), 382–386.

Janah, S. R., Suyitno, H., & Rosyida, I. (2019). Pentingnya Literasi Matematika dan Berpikir Kritis Matematis dalam Menghadapi Abad ke-21. *PRISMA, Prosiding Seminar Nasional Matematika*, *2*, 905–910.

Kurniawan, L., Munandar, D. R., Karawang, U. S., Kurniawan, L., Munandar, D. R., & Karawang, U. S. (2022). *Kemampuan Literasi Numerasi Pada Materi Persamaan SPLDV Siswa SMP*. 340–345.

Mansur, N. (2018). Melatih Literasi Matematika Siswa dengan Soal PISA. *Prisma*, *1*, 140–144.

Masfufah, R., & Afriansyah, E. A. (2021). Analisis Kemampuan Literasi Matematis Siswa melalui Soal PISA. *Mosharafa: Jurnal Pendidikan Matematika*, *10*(2), 291–300. https://doi.org/10.31980/mosharafa.v10i2.825

Mawarsari, V. D., Kintoko, Zaenuri, Kharisudin, I., & Aziz, A. (2023). Students' Errors in Solving Geometry Problems of Van Hiele Levels

Based on Newman's Error Hierarchy Model. *Proceedings of the 2nd UPY International Conference on Education and Social Science (UPINCESS 2023)*, *0*(Upincess), 316–323. https://doi.org/10.2991/978-2-38476-176-0_45

Nataliano Busa, E. (2023). Faktor Yang Mempengaruhi Kurangnya Keaktifan Peserta Didik Dalam Kegiatan Pembelajaran Di Kelas. *Jurnal Sosial Humaniora Dan Pendidikan*, *2*(2), 114–122. https://doi.org/10.55606/inovasi.v2i2.764

Naufal, H. (2021). Model Pembelajaran Konstruktivisme pada Matematika untuk Meningkatkan Kemampuan Kognitif Siswa di Era Merdeka Belajar. *Seminar Nasional Pendidikan Matematika*, *2*(1), 143–152.

OECD. (2018). *PISA 2018 Mathematics Framework*.

Perdana, F. J. (2019). Pentingnya Kepercayaan Diri dan Motivasi Sosial dalam Keaktifan Mengikuti Proses Kegiatan Belajar. *Jurnal Penelitian Pendidikan Guru Sekolah Dasar*, *6*(August), 128.

Prabawati, M. N., Muslim, S. R., & Mansyur, Z. (2021). Analisis Kesalahan Siswa Sekolah Menengah Pertama di Kota Tasikmalaya dalam Menyelesaikan Soal Literasi Matematis pada Materi SPLDV. *Jurnal Penelitian Pendidikan Dan Pengajaran Matematika*, *7*(2), 117–128. https://doi.org/10.37058/jp3m.v7i2.3661

Prasetyo, A. D., & Abduh, M. (2021). Peningkatan Keaktifan Belajar Siswa Melalui Model Discovery Learning Di Sekolah Dasar. *Jurnal Basicedu*, *5*(4), 1717–1724.

Purnomo, E. A. (2020). Implementasi Lesson Study Melalui Model Pembelajaran Problem Based Learning Materi Spltv Kelas X Iik. *AlphaMath : Journal of Mathematics Education*, *6*(1), 36. https://doi.org/10.30595/alphamath.v6i1.7619

Purwati, E., & Samiu, T. (2022). *Implementasi Discovery Learning berbasis Lesson Study untuk Meningkatkan kemampuan berfikir kritis Peserta Didik pada masa pemulihan Pembelajaran di SMKS Pembangunan Ternate*. *13*(2).

Rahayu, I. P., Christian Relmasira, S., & Asri Hardini, A. T. (2019). Penerapan Model Discovery Learning untuk Meningkatkan Keaktifan dan Hasil Belajar Tematik. *Journal of Education Action Research*, *3*(3), 193. https://doi.org/10.23887/jear.v3i3.17369

Ramadhani, R., & Amudi, A. (2020). *Efektifitas penggunaan modul Matematika Dasar pada Materi Bilangan Terhadap Hasil Belajar*. *9*(1), 64–71.

Septiawati, S., Halidjah, S., & Ghasya, D. A. V. (2022). Deskripsi Keaktifan Belajar Siswa Dalam Pembelajaran Tematik Kelas V. *Jurnal Pendidikan Dan Pembelajaran Khatulistiwa (JPPK)*, *11*(6), 168.

https://doi.org/10.26418/jppk.v11i6.55276

Susilowati, D. (2022). Strategi Guru Dalam Meningkatkan Keaktifan Belajar Siswa Pada Mata Pelajaran Ipas. *Seminar Nasional Teknologi Dan Multidisiplin Ilmu (SEMNASTEKMU)*, *2*(2).

Tosi, J., Adji, K., & Budasi, I. G. (2021). Pelaksanaan Implementasi Lesson Study di Kelas 7. *Indonesian Gender and Society Journal*, *2*(2), 58. https://doi.org/10.23887/igsj.v2i2.40414

Wahyuni, R. (2020). Efektivitas Implementasi Lesson Study Learning Community Dalam Meningkatkan Kualitas Pembelajaran. *Equity In Education Journal*, *2*(1), 11–18. https://doi.org/10.37304/eej.v2i1.1681

Wedekaningsih, A., Koeswati, H. D., & Giarti, S. (2019). Penerapan Model Discovery Learning Untuk Meningkatkan Keterampilan Berpikir Kritis Dan Hasil Belajar Matematika. *Jurnal Basicedu*, *3*(1), 21–26. https://doi.org/10.31004/basicedu.v3i1.62

Widianti, W., & Hidayati, N. (2021). Analisis Kemampuan Literasi Matematis Siswa Smp Pada Materi Segitiga Dan Segiempat. *Jurnal Pembelajaran Matematika Inovatif*, *4*(1), 27–38. https://doi.org/10.22460/jpmi.v4i1.27-38

Yerizon, Y., & Sarti, L. (2021). Pengembangan Lembar Kerja Peserta Didik Berbasis Discovery Learning Pada Materi Matriks Untuk Peserta Didik Kelas Xi Sma. *AKSIOMA: Jurnal Program Studi Pendidikan Matematika*, *10*(4), 2879. https://doi.org/10.24127/ajpm.v10i4.4193